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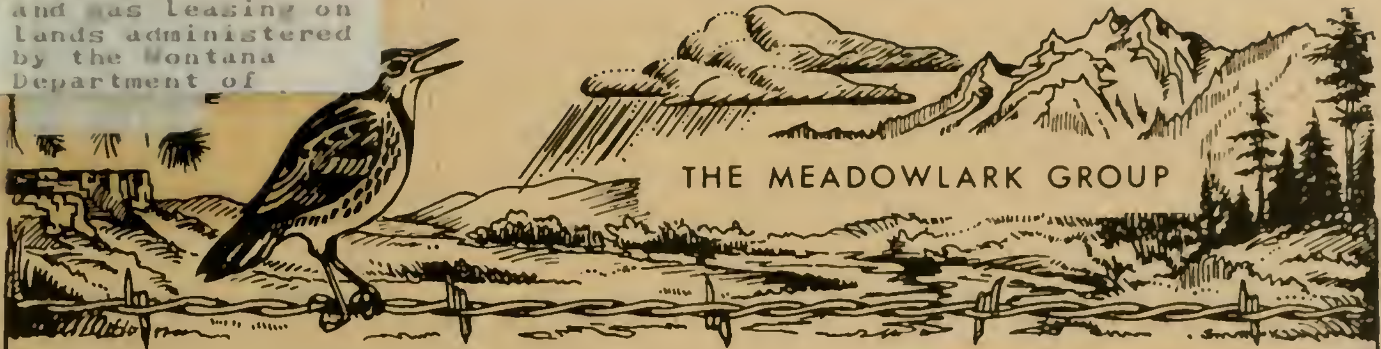

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AN ECONOMIC ANALYSIS OF OIL AND GAS LEASING ON LANDS ADMINISTERED BY THE MONTANA DEPARTMENT OF FISH, WILDLIFE, AND PARKS

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James H. Nybo

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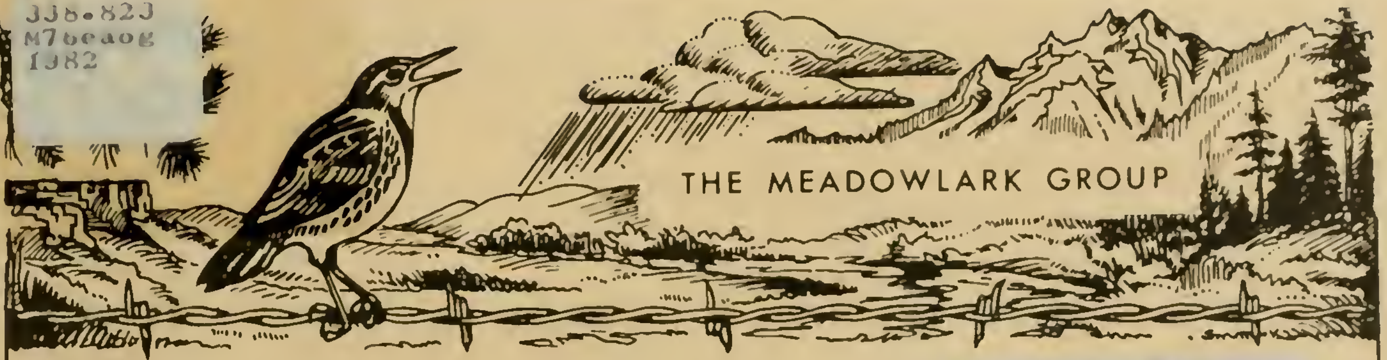

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I. INTRODUCTION

This economic analysis of oil and gas leasing on lands administered by the Montana Department of Fish, Wildlife, and Parks is being carried out in conjunction with the department's programmatic analysis of the problems related to leasing of department mineral rights. This analysis was performed concurrently with the early components of the programmatic analysis, and is intended to contribute to the foundation of the programmatic.

The purpose of this analysis is to examine oil and gas leasing on Department lands in an economic context. The analysis includes several major components, including: a review of the leasing policies of fish and wildlife agencies in other states; a discussion of the legal framework for management of department lands; identification of possible leasing policy alternatives; and an economic analysis of candidate policies.

DEPARTMENT LANDS

Table 1, below, is a summary of lands controlled by the department.

TABLE 1: OVERVIEW OF DEPARTMENT OF FISH, WILDLIFE AND PARKS LANDS

Category	Leased Acres	Purchased Acres	Total Acres
Administrative Sites	18.60	218.58 + 2 lots	237.18 + 2 lots
Wildlife Management Areas	90,867.00	184,134.00	275,001.00
Fish Hatcheries/ Spawning Stations	68.82	283.53	352.35
Fishing Access Sites	1,613.09	15,914.93	17,528.02
State Parks/Monuments/ Recreation Areas	10,216.22	17,735.90 + 61 lots	27,952.12 + 61 lots
GRAND TOTAL	102,783.73	218,286.94 + 63 lots	321,070.67 + 63 lots

II. LEGAL FRAMEWORK FOR LEASING

The authority to acquire and administer lands comes to the department of Fish, Wildlife, and Parks through the laws of the State of Montana, the Montana Codes Annotated (MCA). In addition, parcels which were acquired under federal aid programs or by bequest or donation from private parties or organizations may contain specific provisos or limitations with respect to use or management.

MONTANA CODES ANNOTATED

Actual language of pertinent sections of MCA discussed below have been reproduced in Appendix A.

Land acquisition and management for fish and wildlife purposes is covered in Title 87 of MCA, "Fish and Wildlife." Section 87-1-209 gives the Department, with the consent of the Fish and Game Commission, the authority to acquire lands or waters for listed purposes. If the acquisition involves more than 100 acres or $100,000 in value, the Board of Land Commissioners must also approve. Lands and waters may be acquired by purchase, lease, agreement, or gift, as can easements. The purposes include: fish hatcheries, nursery ponds, or game farms; lands for game, bird, fish, or fur-bearing animal restoration, propagation, or protection; public hunting, fishing, or trapping areas; land for propagation, stocking, or control of species; state parks and outdoor recreation; and historical or archaeological sites. Procedures are spelled out for the sale of lands as well.

The use of fish and game money is addressed in 87-1-601. Specified revenues are to be placed in the earmarked revenue fund. Money received from federal sources is to be deposited to the federal and private revenue fund. That money is to be used for the purposes of salaries, per diem, fees, expenses, and expenditures by the department, subject to legislative appropriation.

Money received by the department from exploration or development of oil, gas, or mineral deposits from lands acquired by the department except royalties or other compensation based on production shall be deposited in an account within the trust and legacy fund of the state treasury. The interest derived therefrom, but not the principal, may be used only for the purpose of operation, development, and maintenance of real property of the department, and only upon appropriation by the legislature. Its use, however, must not violate any applicable federal laws or state statutes.

Land Acquisition and management for the purposes of parks is discussed in Title 23 of MCA, "Parks, Recreation, Sports, and Gambling."

Section 23-1-102 grants the department the power and duty to study the state's scenic, historic, archaeologic, scientific, and recreational resources, and to acquire areas, sites, or objects as state parks, state recreational areas, state monuments, or state historical sites.

Section 23-2-102 designates the department as the state agency to represent and act for the state for the purpose of implementing the Land and Water Conservation Fund Act of 1965 (LWCF).

Section 23-2-103 directs the department to do those things necessary to comply with the provisions of LWCF, including accepting and administering moneys paid by the Secretary of the Interior for approved projects and acquiring and developing outdoor recreational areas and facilities.

Neither Title 87 nor Title 23 contain any reference to the leasing of lands managed by the department for the exploration or production of oil and gas.

FEDERAL LAWS AND REGULATIONS

The major federal legal issue facing the leasing and development of department lands revolves around "diversion of funds." Simply put, diversion of funds is a condition wherein the state takes an action which results in funds which were required by federal law or regulation to be dedicated to a particular purpose are diverted to another purpose. When the federal government determines that diversion of funds has occurred, it will curtail federal aid to the state until the diversion problem has been corrected. Diversion of funds has been examined in some detail by DFWP with respect to the use of hunting and license fees and the interest earned on invested fees. Consult further the memorandum to Director James Flynn by legal counsel F. Woodside Wright, dated April 15, 1982.

While some of the legal issues raised with respect to the license fee question may apply to oil and gas leasing, there is another facet of diversion of funds which is much more directly germane.

Since DFWP lands acquired with federal aid were acquired for a definite purpose, when other uses are permitted which interfere with the approved project objectives, a diversionary situation exists. While most informed parties agree that the interpretation of the diversion of funds requirements is still somewhat unclear, it was addressed directly by the department of the Interior in letters to the Washington Department of Game in 1979. The following discussion is based on those letters. The letters are contained in the file material transmitted to DFWP with this report.

The rules and regulations of the Secretary of the Interior (50 CFR Part 80.5) state:

> "A diversion of Federal Aid funds occurs whenever they are applied by a State to activities or purposes which are not a part of an approved project, or when real property acquired or constructed with Federal Aid funds under these Acts passes from the control of the State Fish and Game Department, or is used for unapproved purposes in a manner, or to an extent, which interferes with the accomplishments of project purposes as they were approved by the Secretary, or as they may be amended with the approval of the Secretary."

Under the Pittman-Robertson or Dingell-Johnson Federal Aid programs, lands are acquired or developed for definite purposes, e.g. big game winter range, waterfowl habitat, etc. These purposes must meet the requirements of the respective Federal Aid Act, and receive the approval of the Secretary of the Interior before federal aid funding can be provided. To receive the Secretary's approval, the purpose must emanate from a valid need. The approved objective is retained with the project until changed or the project is disposed of by mutual agreement of the State and the Secretary. A diversionary situation develops when the Department loses jurisdiction over the project or permits other uses which are inconsistent with the project purpose.

The mechanics of a determination of diversion places the burden of proof on the Department. If the Department determines that a new use, in this case the leasing of oil and gas rights, would not interfere with program objectives, DFWP must obtain the Secretary of the Interior's concurrence before the new use can commence. The request for approval must include a supporting document that provides an analysis of the proposal and gives convincing evidence that the proposed activity would be compatible.

With respect to the production and distribution of income, regulation 50 CFR 80.23 forbids the use of Federal Aid funds for the specific purpose of producing income, but does allow the production of income which is incidental to the project activities. Such income must be credited, however, to the respective Federal Aid Program (P-R or D-J) which funded the project. These funds can then be applied to activities currently in progress or toward new projects or activities, but in either case they must be properly documented.

It is clear that the department and commission should carefully review any proposed leasing action where federal aid funds for either acquisition or development may come into play, prior to making a commitment to lease. If the state finds there is no conflict with the approved purposes of the project, then an amendment to the original Application for Federal Assistance (AFA) must be submitted along with documented justification. It is estimated that these requirements will apply to in excess of eighty percent of lands controlled by the department, both leased and purchased.

III. LAND MANAGEMENT POLICY OBJECTIVES

Simply put, the primary land management objectives of the department are embodied in its name: Fish, Wildlife and Parks. Table 1 in Chapter 1 contains an overview of the lands controlled by the department.

The following definitions of different land categories give some understanding as to the reasons for land acquisition.

1. Wildlife management areas usually serve several purposes, principal among them being winter ranges for big game and rearing areas for waterfowl. Nongame species as well as upland game birds and furbearing species are also considered in the area management plans. Many of these locations provide opportunities for public hunting and fishing as well as viewing and photographing game and nongame wildlife species.

2. Fishing access sites are located along lakes, streams, and rivers, and assure permanent public access to prime fishing waters. Many are developed for appropriate outdoor recreational use and provide relief from heavy public use on private lands. Many also serve as habitat for small game species.

3. State parks, monuments, and recreation areas are sites with scenic, scientific, historical, archeological, or recreational significance, and represent outstanding examples of the state's natural and cultural resources. These lands and appurtenant facilities are managed to provide maximum recreational opportunities to Montana's residents and visitors.

4. Other areas, including fish hatcheries, administrative sites, and bird farms are small in size and specialize in the services which they provide.

Federal funding for land purchases is available from several sources, usually on a matching basis. Federal participation requires compliance with strict federal regulations and the U.S. government retains some control over any lands purchased with that assistance.

Because of concern regarding the effects of public land holdings on the local property tax base, state law (87-1-603, MCA) requires the department to make payments in lieu of taxes. The department-owned lands in each county are assessed, and annual payment is made in the same amount as if the lands were privately owned. These payments in lieu of taxes are not required for lands totaling less than 100 acres per county, for lands used as bird farms or fish hatcheries, or for lands purchased by legislative apportionment from the state's general fund.

The preceding definitions and discussion have been drawn from: "Lands Controlled by the Montana Department of Fish, Wildlife & Parks," published by the department in July of 1980. It includes a detailed listing of all lands controlled by the department at that time, as well as a detailed listing of payments in lieu of taxes.

In contemplating the leasing of department lands for oil and gas exploration and production, the following objectives should be considered:

1. Management of the lands for the purposes for which they were acquired.

2. Adherence to any legal restrictions on the use of the lands, including federal rules or regulations, state law, and stipulations or covenants associated with the land title.

It appears that leasing should be considered if and only if these two objectives can be fully met.

It is also clear that oil and gas exploration and development present the potential for impacts which could be detrimental to the purposes for which the lands were acquired, and furthermore, may in some cases be directly conflicting with legal obligations.

Leasing of department lands raises a fundamental policy question. Is it possible to lease lands controlled by the department for oil and gas development and satisfy the land management objectives for which the lands were acquired? If a decision is made to pursue leasing, then the commission may choose to restrict leasing only to those situations where it will not have a detrimental effect on land management objectives, or it may choose to permit certain negative impacts on specific values in exchange for something of equal or greater value to Montana's fish, wildlife and parks.

On the other hand, it also appears to be the case that where natural and recreational values can be protected while permitting oil and gas leasing, there are potential opportunities to benefit those natural and recreational values. Improvements can come from additional revenues being available to improve or acquire lands, as well as possible in-kind improvements or acquisitions which could be negotiated within the terms of a lease agreement.

Although not specifically a matter of oil and gas leasing policy, the department and commission should not lose sight of the fact that perhaps two-thirds of lands "controlled" by the department are subject to possible lease by another entity--the lessor in the case of leased lands, or a mineral owner where the mineral and surface ownership are separate. The commission's leasing policy for lands where minerals are owned may be important in influencing the policies of other lessors as well as in the protection and/or mitigation of surface values in cases of split ownership.

IV. A COMPARISON OF LEASING POLICIES IN OTHER STATES.

The circumstances facing the Montana Department of Fish, Wildlife, and Parks, are not entirely unique. Other states also face the sometimes difficult task of managing wildlife habitat, parks, fishing and hunting access sites, and so forth in a manner which satisfies the primary objectives for which the land was acquired, while making appropriate allowance for other useful purposes to which these lands might be beneficially put.

An important foundation in the development of an oil and gas leasing policy is an examination of the policies used by counterpart agencies in other states. This chapter presents a summary of a survey made of the leasing policies of other western states. The approach used was to develop a standard format for reporting the pertinent information. That form was then sent for completion. In addition to the information which follows, the state fish and wildlife agencies were requested to submit any other pertinent information, such as standard lease agreements, studies, and so forth. This material has been placed in a file which accompanied this report to the department.

Figure 1 is a summary of the findings of the survey. The royalty rate is typically 12.5%, with several at 16.67%, one state at 18.75%, and one going as high as 40%. Annual rental is typically $1.00 per acre. One state doubles the rental rate in years 2 and 3 if the tract has not been drilled the preceding year. This is similar to delay rentals frequently seen in the industry. States surveyed were evenly split between lease durations of five and ten years, with two states having three year terms. Most state fish and game agencies treat all categories of land they manage the same, regardless of its path of acquisition. Revenue disposition is typically credited to the appropriate federal aid fund or state program fund, as appropriate. Most states have under a thousand acres under lease at this time.

The exception to most other states surveyed on several points was Louisiana. Louisiana has several hundred thousand acres under lease, and takes in over $3 million in royalties in a typical month.

In addition to the states included in Figure 1, Montana's neighbor, North Dakota, reported owning essentially no minerals. They have not faced any development, have not formulated leasing policies, and hence were not included in Figure 1.

A number of responding states included sample lease forms and protective stipulations with their reply. The full reply is contained in the file mentioned above.

Appendix B contains more detailed summary forms for each of the responding states.

FIGURE 1: LEASING POLICY COMPARISON

	Colorado	Idaho	Louisiana	New Mexico	Oregon	Pennsylvania	Washington	Wyoming
Royalty Rate								
Oil %	16.67	12.5	16.67-40	18.75	12.5	12.5	12.5	16.67
Gas %	16.67	12.5	16.67-40	18.75	12.5	12.5	12.5	16.67
Annual Rental ($/Acre)	1,2,4 (Note 1)	1	50-3,000	1	1	35,1 (Note 2)	1.25	1
Lease Duration (Years)	3	10	3	5	10	10	5	5
Limitations on Surface Activity	Yes	Yes	Yes	N.A.	Yes	Yes	Yes	Yes
Different Provisions for Different Classes of Land?	No	Yes	Yes	No	No	No	No	No
Lease Acquisition Method	Oral Auction	Oral Auction	Sealed Bid	Sealed Bid	Oral Auction	Negotiation	Oral Auction	Simultaneous Filing
Disposition of Revenues	(Note 3)	(Note 4)	(See App B)	(Note 5)	N.A.	(Note 6)	(Note 7)	(Note 8)
Acres Currently Under Lease	867	11,080	200,000 +	823	N.A.	468	None	5,000

Note 1. Rent doubles each year if not drilled in preceding year.
Note 2. First year's rent is $35; rent is $1 in each succeeding year.
Note 3. Credit to Federal Aid Project or to game cash fund, as appropriate.
Note 4. 75% to PR/DJ; 25% to Game and Fish fund.
Note 5. Game protection fund.
Note 6. To appropriate Federal Aid income fund or Fish or Boat fund.
Note 7. PR/DJ: to program; LWCF: recreation enhancement; Game fund lands: agency has full authority for use.
Note 8. Filing fee: land board; rental and royalty: GF Dept.; on FA projects, 75% to FA fund, 25% to GF Gen Fund.

V. LEASING POLICY ALTERNATIVES

The following list is a full collection of possible policy alternatives which have been identified in the course of this analysis.

Those which have been selected for evaluation are marked with an asterisk (*). Those which were selected for evaluation are described and discussed in the following chapter.

TO LEASE OR NOT TO LEASE

*A. No leasing.

*B. Delay leasing.

*C. Leasing.

1. General Standards.

2. Site-specific determination.

HOW TO LEASE

Environmental Stipulations.

A. Surface Access and Use

*1. No surface occupancy (NSO).

*2. Restricted surface occupancy.

a. Seasonal.

b. Limited to existing roads.

c. By individual permission only, each request to be evaluated.

B. Reclamation, Mitigation, and Bonding.

General Terms and Conditions of Leasing.

*A. Adopt by reference the general terms used by the Board of Land Commissioners for State School Lands. This includes royalty rates, delay drilling penalties, rentals, and lease duration.

*B. Establish by Fish and Game Commission action specific terms and conditions to apply to FWP Lands.

Operational Mechanics

*A. Require each successful bidder to provide the department with a mineral interest title opinion of the leased lands. (See Colorado file).

Lease Acquisition

*A. Oral Auction or Sealed Bid

1. Fish, Wildlife, and Parks Dept., Fish and Game Commission, or Board of Land Commissioners.

*B. Negotiation

1. Individually by tract

2. Master lease agreement for all tracts

Lease Administration

A. Fish, Wildlife, and Parks

B. Department of State Lands

VI. ANALYSIS OF THE ALTERNATIVES

The analysis of the alternatives specified in Chapter V has been approached in two ways. The first is through the use of a simulation model which portrays possible levels of leasing and production activity and the corresponding levels of revenues which might accrue to the state by virtue of that activity. Several scenarios have been specified which can be associated with the various alternatives. Because of the substantial uncertainty with respect to both the quality and quantity of department oil and gas holdings, as well as uncertainty with respect to future market conditions and industry activity, the simulation of alternative futures under specific sets of assumptions was deemed the best analytical approach.

Following the discussion of the methodology and the presentation of an overview of the analytical results, the alternatives selected for analysis are discussed individually. The various policy alternatives are considered in terms of their possible contribution to or conflict with departmental land management policy objectives, as well as their potential financial contribution to state and departmental financial objectives, and their practicality in terms of the mechanics of administration.

METHODOLOGY

The analytical approach uses a large electronic spread-sheet program on a micro-computer. This facilitates calculations which describe key aspects of possible departmental leasing activities.

Six scenarios have been specified, as outlined in Figure 2.

Figure 2: Oil and Gas Development Scenarios for Analysis, Montana Department of Fish, Wildlife and Parks.

Policy	Industry Activity and Success Low	High
No Leasing	0	0
Delayed Leasing	1*,2*,3*	4*,5*,6*
Lease - various Levels		
Low	1	4
Medium	2	5
High	3	6

* Dollar flows assumed delayed five years

The scenarios are primarily dependent on the number of acres brought under lease, on the timing of leasing activity, on the cash bonuses paid for the leases, and ultimately on production that might occur. Therefore, it is essential to take the scenarios identified above and express them in more specific terms.

Based on discussions with department personnel, it is estimated that the practical maximum number of acres, under which the department owns the oil and gas mineral rights, and which might ever be leased, is 100,000 acres. This level then serves as the foundation for assumed levels of activity under the different scenarios. The maximum acre figure will be adjusted using the factors found in Figure 3. The adjusting factors from the top row and the left column are multiplied together to produce the overall adjusting factor applied to generate the acreage leased under the different scenarios.

FIGURE 3: Adjusting Factors for the Development Scenarios.

	Industry Activity and Success	
	Low: .50	High: 1.00
Lease Level		
Low: .25	.125	.25
Medium: .50	.25	.50
High: 1.00	.50	1.00

Timing is the next factor to enter the analysis. The period of interest for the simulations is from the present to the year 2000. It is assumed that the maximum will be reached in the year 1990, and that leasing will remain at that level through the year 2000. Since the policy to delay leasing is essentially that, the range of effects is assumed to be the same as the other leasing levels, but delayed five years. The delay leasing alternative is discussed at length in the last section of this chapter.

These assumptions then allow the development of Figure 4, which defines the maximum levels of acres under lease under each scenario.

To further adjust for a lower level of industry activity and success, scenarios 1, 2, and 3 vary from 4, 5, and 6 in the following ways:

a. Production, from which royalties will be earned, is assumed to be half the "high industry success" scenarios.

b. Average bonus per acre will be one-half the "high industry success" scenarios.

The complete results of the six scenarios are found in Appendix C. A summary of the results is found in the following section.

Figure 4: Maximum Acres Leased Under the Development Scenarios (Scenario Number: Acres)

Policy	Industry Activity and Success Low	High
No Leasing	0:0	0:0
Lease - Various Levels		
Low	1:12,500	4:25,000
Medium	2:25,000	5:50,000
High	3:50,000	6:100,000

ANALYSIS - SUMMARY OF RESULTS

Figure 5 is a summary of possible levels of leased acreage and gross revenue in the form of income (rentals, bonuses, and penalties), and royalties based on production. Before describing the results, several caveats must be introduced. The purpose of the simulation model is to provide a crude approximation of possible levels of activity and the associated gross revenues which might occur at those levels. The scenarios were based on the best available information about the specific lands in question (very general) and an understanding and analysis of the oil industry in Montana and particularly the experience on lands administered by the Montana Department of State Lands. Six scenarios were postulated to accommodate the needs of a policy-maker in the absence of more specific information.

Going beyond the limitations of the simulation of revenues is the caveat that revenues in the form of income and royalties should be considered gross revenues. That is, they can be thought of as gross financial benefits associated with leasing. To place revenues in perspective, contrast them with any costs associated with the activity--both to monitor and administer the leasing as well as any damages to the land in terms of the purposes for which it was acquired. As a policy matter, there is no particular reason why DFWP should subsidize oil and gas leasing by incurring administrative costs or sustaining damages to program values. If the Commission were to adopt the policy that oil and gas leasing was strictly a secondary activity on department lands, and that all administrative and damage costs would have to be borne by the lessee over and above the revenues estimated in the simulation analysis, then the estimated revenues would have more relevance.

Figure 5 is a summary of the results of the simulation runs of the six scenarios defined in the preceding section.

FIGURE 5: SUMMARY--POSSIBLE LEASED ACRES, ROYALTIES, GROSS INCOME, SCENARIOS ONE THROUGH SIX, ROYALTIES AND INCOME IN CONSTANT 1982 DOLLARS.

SCENARIO	1	2	3	4	5	6
Lease Level	Low	Medium	High	Low	Medium	High
Industrial Factor	Low	Low	Low	High	High	High
1985						
Acres	4687	9375	18750	9375	18750	37500
Income	19765	39531	79062	69687	139375	278750
Royalties	0	0	0	0	0	0
Income + Royalties	19765	39531	79062	69687	139375	278750
1990						
Acres	12500	25000	50000	25000	50000	100000
Income	37343	74687	149375	104843	209687	419375
Royalties	16627	33255	66510	66510	133021	266043
Income + Royalties	53971	107943	215885	171354	342709	685418
1995						
Acres	12500	25000	50000	25000	50000	100000
Income	37343	74687	149375	104843	209687	419375
Royalties	27712	55425	110851	110851	221703	443406
Income + Royalties	65056	130113	260226	215695	431390	862781
2000						
Acres	12500	25000	50000	25000	50000	100000
Income	37343	74687	149375	104843	209687	419375
Royalties	27712	55425	110851	110851	221703	443406
Income + Royalties	65056	130113	260226	215695	431390	862781

SOURCE: The Meadowlark Group

Figure 5 reports, for each of the six scenarios, information for the years 1985, 1990, 1995, and 2000. All dollar values are expressed in constant 1982 dollars. Royalties have been separated from other income to allow for treating them differently. Royalties reflect a permanent and irretrievable commitment of the mineral resource. Once extracted, that mineral can never be produced again.

To highlight Figure 5, the analysis estimates that total revenues could at the lower level reach an annual level of $65,056 under scenario one, while they could go as high as $862,781 if the policies and market conditions produced scenario six.

DISCUSSION OF CONSIDERED ALTERNATIVES

In Chapter V, a broad range of leasing policy alternatives was identified, and several were selected for consideration in this analysis. In this section, the alternatives selected for consideration are defined and discussed. The discussion covers the advantages, disadvantages, and implications of the various alternatives. Where an alternative is expected to have results similar to development scenarios examined in the simulation model, the quantitative results are mentioned.

TO LEASE OR NOT TO LEASE

This is the first policy question which must be addressed.

*A. No leasing. If the determination were made that the land management policy objectives could not be met while also leasing lands for oil and gas development, then the no leasing alternative should be selected. In its simplest form, this alternative, if formally adopted, would probably require a finding that leasing was inconsistent with departmental land and resource managment policy objectives, and that the policy was to not entertain oil and gas leasing applications.

The impacts of this policy on the department fall into three categories.

First, adverse environmental impacts resulting from leasing on lands controlled by the department would be non-existent, as no impact-causing actions would be allowed.

Second, the financial impacts, in terms of any revenues accruing to the department or the federal aid program funds would also be non-existent. There would also be no need to expend DFWP staff time on the review and monitoring of leasing.

Third, there would be a risk of possible drainage of oil or gas resources owned by the department, in cases where production on nearby tracts would contribute to the depletion of resources underlying department lands. It is well known that oil and gas are fluids which can move laterally under ground. The possible magnitude of drainage losses cannot be estimated at this time. Drainage would only occur if a DFWP tract were underlain by oil or gas, and if a nearby well were producing from the same physical pool. Under the rule of capture, the producer is entitled to take the oil from his well. The state's recourse is to either drill an offset well or enter into an agreement with the operator to obtain a share of the production. This agreement is typically in the form of a lease.

By adopting a policy of not leasing, the Commission would establish a firm posture with respect to the effects of oil and gas activities on the values for which the department is responsible. Thus, if the Commission chose to oppose oil and gas development on state or federal tracts where the surface rights are leased by the department, it would be pursuing a consistent policy on both owned and leased lands. This points out, however, that the leasing policy decision has implications for lands where minerals are not owned as well as where they are.

*B. Delay leasing.

In a study for the Department of Fish, Wildlife and Parks pursuant to the Preliminary Environmental Review of leasing on the Sun River Game Range, economist Dr. John Duffield observed that the prices of crude oil and natural gas have been rising in recent years, and that the value of oil and gas revenues to the lessor increases as those prices increase. Duffield concluded that a temporary or long-term withdrawal of some state lands may be in Montana's best interest. The primary basis for Duffield's recommendation appears to be the assumption that producer prices for oil and gas will rise at rates substantially greater than the general price level, an explicit part of his analysis, and that the level of industry interest in departmental land holdings will continue to be as strong in the future as it seems to be today. This second point was not explicitly stated, but it is a necessary assumption for the logic to hold. A second major point of justification raised by Duffield for the policy of delay relates to the unique purposes for which the lands were acquired, and the related non-market environmental and social benefits. Duffield's second point is the essential policy issue that this study points out must be addressed by the Commission in deciding whether or not to proceed with leasing.

The primary point in support of the delay leasing policy, however, presents major problems if it is to be adopted as a model for making leasing decisions. Looking at the long-term history of real crude oil prices (Nybo, 1982), as well as at recent rather severe fluctuations in well-head prices, it is clear that there can be no absolute certainty that real crude oil prices will continue to rise. If the policy decision to allow leasing is based on a conclusion that the non-market values of importance to departmental land management can be protected and/or enhanced concurrently with leasing, then one still reverts to a basic operational question under the delay leasing alternative. That is, how long should leasing be delayed to maximize returns to leasing, and what decision rule is used to tell the policy-maker when market conditions would result in the maximization of lease revenues. This policy should be questioned by the Commission for the following reasons:

1. Both longer-term and recent history indicate that there is no guarantee that well-head prices of crude oil will continue to increase in real terms.

2. There is no practical and affordable way for the department to predict future producer prices with certainty sufficient for public policy.

3. Bonus bids in unproven areas depend not only on the bidder's expectations of future price levels, but also on expectations of physical production. A great deal of the flurry of leasing in Montana in recent years has been a form of speculation based on unproven beliefs that the overthrust belt of Montana will prove to be a major oil and gas producer. As wells are drilled and seismic work is performed, the facts will become known. While there is no certainty that any of the very high hopes will be realized, it is also the case that even if there are major finds, they will not be evenly distributed across western Montana. In the event of major finds, there is every likelihood that some areas will be very hot and others will deliver only dry holes.

Thus, for all three reasons there is the distinct possibility that a decision to delay would result in less revenues to the state rather than more.

*C. Leasing.

Because of the nature of departmental lands, a policy of leasing will probably require a mechanism to discriminate between tracts in a way that would result in some tracts being leased and others not. Although not mutually exclusive, there are two approaches for determining whether a tract should be leased. They are through the adoption of general standards, or through a process of site-specific determination.

1. General Standards.

A process of general standards would spell out specific criteria which would have to be met before a tract would be permitted for leasing. If it could be clearly shown that all criteria were met, then the decision to lease would be essentially a routine one. The following are a few hypothetical criteria which might be adopted, presented purely for example.

1. The tract must be suitable for development without surface occupancy by the lessee. 2. Access to drill sites or for any other purpose relating to the lease must be gained through existing roads.

3. The values for which the land was acquired must in no way be diminished by virtue of entering into a lease.

This policy would require the explicit statement of leasing criteria. This could be a difficult task, given the variety of lands owned by the department. On the other hand, the criteria could serve not only as a detailed checklist for the selection of tracts to lease, but also for the imposition of protective stipulations where leasing occurs. The existence of general standards would allow the adoption of a policy of placing the burden of proof on the applicant to show that a tract could be leased consistent with departmental standards.

The potential financial contributions under this policy would depend on the mechanics of the process and the stringency of the standards. A finely tuned process with relatively unrestrictive standards would probably result in the medium to high level leasing scenarios (2,3,5,6). A process which was more expensive to the potential lessee in time and money, or with more restric-tive standards would lean toward the low leasing level scenarios (1,4).

From a practical standpoint, general standards allow the rules of the game to be known in advance by all the players. They also allow the burden of proof to be shifted to the applicant, with the side benefit of causing him to think about the wildlife and other values important to the DFWP.

2. Site-specific determination.

Under a policy of site-specific determination, upon receipt of an indication of interest in a particular tract, departmental personnel would perform a field inspection of the tract, and recommend whether or not the tract should be considered for leasing. This alternative is probably somewhat less likely to place departmental land management objectives at risk, because both standards and a DFWP site evaluation would be specific to the site.

This policy would probably result in the low to medium lease level scenarios (1,2,4,5).

Greater staff resources would be required, and a mechanism to recover staff costs would need to be worked out.

If the level of leasing interest is low, or if the Commission adopts a go-slow policy while continuing to review other options, then the site-specific determination offers some advantages. On the other hand, it could contribute to long delays, applicant frustration due to not knowing the rules of the game, and substantial departmental costs if adopted as the long-term policy and if industry interest is very high.

HOW TO LEASE

Environmental Stipulations.

Environmental stipulations are those terms and conditions associated with the oil and gas lease that are established by the lessor prior to the finalization of the lease agreement, their purpose being to provide for the protection or enhancement of assets or conditions associated with the leased property, or the mitigation or restoration of possible damages. The imposition of stipulations is perhaps the most common technique used for this purpose. Stipulations can cover any number of areas of concern, but those of particular interest to DFWP are discussed below. In addition, stipulations are commonly used for technical aspects of drilling activity, such as blow-out prevention, spill and fire prevention, and so forth.

A. Surface Access and Use.

Because DFWP is particularly concerned with impacts on the surface, due to the purposes for which the land is held, surface access and use are an important point of interest.

*1. No surface occupancy (NSO).

At one end-point on the spectrum of levels of use is the stipulation of no surface occupancy. This is self-explanatory. No right to have access to the land surface or to perform any activities on the surface is granted as part of the lease. This is a departure from the typical lease, which grants the lessee the right to have access to and to use reasonable portions of the surface for activities directly related to and necessary for the exploration and development of oil and gas. The major activity is the drilling of one or more wells, which requires both an actual drill site, active storage for drill pipe and other equipment and materials required in the drilling operation, as well as an access road, a pit or tanks for drilling fluids, a possible storage tank for crude oil, and possible pipeline right-of-way for collecting and transmitting the oil or gas. Depending on company policy and the location of the drill site, portable structures for housing and feeding the drilling crew may also be placed on the site.

The NSO stipulation has a different effect depending on the size of the tract and how it fits into the lessee's development strategy. If it is a small fishing access site surrounded by lands already under lease, and not strategically located in the lessee's development block, then the lessee will probably not be adversely affected by an NSO stipulation. A small tract is usually of interest to an oil developer to allow the completion of a block. Because the rule of capture can cut both ways, an operator will not risk the cost of a well if he is in danger of someone else putting in an offset well right in the heart of his pool of oil or gas. Primarily for the purpose of conservation of oil and gas, the Montana Board of Oil and Gas and the Oil and Gas Conservation Division of the Montana Department of Natural Resources and Conservation regulate several technical aspects of the industry, including the spacing of wells. The standard spacing of a well is one per 320 acres. There are procedures which allow variation from this, but it is a useful general guidepost. If the developer is assembling a block larger than the well spacing size and is interested in a tract much smaller, then there is probably a good chance that NSO will not be a great imposition.

The particular advantage to the department in entering into an NSO lease is that it would provide the state with royalties if it was part of a producing block.

On the other hand, if NSO would make it difficult or impossible to move the rig to the drill site, or if it would make it difficult to space wells in the field for optimal production, then it would make the lease much less attractive.

In recent years the drilling industry has developed substantial capabilities in the area of directional drilling. A well which deviates significantly from the vertical is drilled directionally. The technique used to cause a drilling rig to change paths from a straight line is to withdraw the rig when it has reached a point where a curve is desired, and insert a block which will deflect the drill into a new direction. Directional drilling is more costly than vertical drilling, and directional drilling requires special permission from the Montana Board of Oil and Gas. It does, however, afford benefits where the surface directly over the target formation is problematic. An example would be formations under a body of water such as a lake.

*2. Restricted surface occupancy.

A restriction of surface occupancy, short of a prohibition, can take numerous forms.

a. Seasonal.

Some areas, such as big game winter range or calving areas, have a special role to play in the life cycle of animals, which must be fulfilled during a specific time of the year. Thus a seasonal restriction of surface occupancy would prohibit men and equipment in a given area during specified times of the year. On a smaller tract without strategic location, this might not be of particular concern, while on the large tract where the drilling plan calls for drilling a very deep (and time-consuming) well, and/or where the tract had an important location in the overall drilling strategy, this stipulation could be quite significant to the developer's interest in the lease and the value he places on it.

b. Limited to existing roads.

Roads are an essential support link for oil and gas drilling. One policy to minimize the additional adverse impacts on a tract would be to restrict the driller to the use of existing roads only. Depending on the road system and the drillers preferred plans, this could range from no impact to having the effect of prohibiting development. In general, it would make a tract less desirable and less valuable.

c. By individual permission only, each request to be evaluated.

This is simply a variation of the above options, but retaining the flexibility of dealing with certain circumstances when they arise rather than laying out everything at the point of lease advertisement or even entering into the lease.

B. Reclamation, Mitigation, and Bonding.

From the earlier discussion of the land management policy objectives of DFWP, it is clear that the values of wildlife, fish, and recreation are the primary purposes to be satisfied by the department in land management. Therefore, there is a natural interest in means available to protect and enhance those values.

Reclamation refers to actions taken subsequent to industry activity on a site which would return the land and other features and values to their original or better condition. This could include roads, drill sites, abandoned wells, buried pipes, mud pits, and so forth.

Mitigation refers to payments or measures taken to soften or make up for the damages imposed. For example, DFWP might choose to allow the disruption of a particular piece of habitat in exchange for mitigating measures such as the purchase or enhancement of other habitat which would on balance leave the wildlife as well as or better off than they were previously.

Bonding refers to a mechanism used to guarantee that the lessee will perform all commitments satisfactorily. It is commonly used in other areas, such as plumbers digging up public streets to repair pipes. If the plumber fails to properly repair the street, the city can make a claim on the bond which he has posted.

The matters of reclamation, mitigation, and bonding raise questions of mechanics which need to be addressed before they are put in place. A policy which relies on these components should be absolutely explicit in defining what performance is required, and how determinations are to be made as to the acceptable level of reclamation or mitigation, and the criteria for causing the developer's bond to be used for compliance.

Furthermore, the costs to DFWP to monitor industry performance could be substantial if industry activity were at a high level.

General Terms and Conditions of Leasing.

Aside from protection of surface values and other concerns of particular concern to DFWP, a decision to lease requires the establishment of a number of other terms and conditions of leasing. In particular, the following: annual rental, royalty rate, term of the lease in years, delay drilling penalties, requirement to drill an offset well in the event of drainage, reporting requirements, and so forth. This analysis examines two alternatives.

*A. Adopt by reference the general terms used by the Board of Land Commissioners for state school lands. The Department of State Lands administers over five million acres of current oil and gas leases at this time, amounting to over 11,000 leases. With millions of acres and millions of dollars at stake, DSL and the Board of Land Commissioners have a strong obligation to see that the terms and conditions of state leases are beneficial to the state, both in terms of financial returns as well as in the mechanics of administration. If DFWP enters into an active leasing program, it would be possible to adopt the general terms and conditions used by DSL in leasing to apply to DWFP leases. Doing so would allow the formalization of many aspects of a leasing policy without having to go to the effort to review the myriad aspects of leasing which would otherwise have to be considered. On the other hand, the department would sacrifice flexibility in adopting the standards, which might be meaningful in the event of unique circumstances which certainly could be encountered.

*B. Establish by Fish and Game Commission action specific terms and conditions to apply to FWP Lands.

This alternative would allow DWFP the leeway to either set generalized terms and conditions as deemed appropriate, or to vary from general terms when there was reason to believe it would be advantageous to departmental objectives. In particular, a strategy of negotiating individually for leases, particularly if it included an effort to take values in kind rather than money, for example, acres of additional big game winter range as a contribution to make up for lost or damaged habitat.

Operational Mechanics.

*A. Require each successful bidder to provide the department with a mineral interest title opinion of the leased lands. (See Colorado file).

There is substantial uncertainty within DFWP as to the status of mineral ownership on department lands. There would be substantial expense for the department to take the initiative and perform title research on each parcel it owns, but there is an alternative means for assembling a better information base. In the manner of Colorado, DFWP could require as a condition of receiving a lease, after all other conditions have been met, that the successful lessee provide the department with an attorney's legal mineral interest title opinion. This is a document prepared by an attorney, often in the form of a letter, which sets out the believed ownership of the mineral interest in the subject tract.

This is probably not a particularly burdensome requirement to place on the lessee, since it is probably work which most responsible lessees would have done anyway. By making this a requirement, the department would begin to assemble a base of reliable information on its mineral ownership, with the parcels of greatest interest being done first, and without the out-of-pocket costs of having to do it with department resources. Of course the opinion is not binding, but it would be a reflection on the reputation of the attorney preparing it, and would also place a burden on the lessee in the event of a question as to the state's mineral interest.

Lease Acquisition.

The general advantages and disadvantages of an oral auction versus saled bids have been addressed by Nybo (1982) and McDonald (1979). The following is from "An Economic Study of Oil and Gas Royalty Rates," by Nybo.

> "Evaluation of the current method of an oral auction in contrast to using sealed bids is not so clear-cut. There is a typical pattern of behavior for bidders at an auction. That is to open the bidding at substantially less than the maximum one would be willing to pay. When there is bona fide competition, with multiple bidders who enjoy an understanding of the value of the item being auctioned, then the bidding quickly moves above the (sometimes ridiculously low) opening bid, and bidders drop out as their pre-determined maximum is reached and exceeded. While the final winner may not have to pay his maximum price, in a competitive situation his maximum will only be incrementally greater than the second-place bidder. Thus, a successful oral auction requires competition, which is characterized by numbers of interested bidders with similar information bases.
>
> "The sealed bid approach offers both advantages and disadvantages to the state and to bidders. On the plus side for the state, bidders must determine their own maximum offer, and then make a judgment as to how close to it they will come in submitting their written bid. In cases where competition was lacking with oral auctions, this would tend to garner for the state higher bids. Where there is relative certainty, bids by different parties should be fairly close to each other. Where there is substantial uncertainty, or where parties gamble by making a ridiculously low bid, there can be a wide margin between bids received. On the plus side to the bidder, persons who actually have decision-making authority in a firm do not have to be present at the auction. To contribute to the competitive quality of the auction, bidders do not know the identity of their competition. Sealed bidding tends to be less emotional than oral auctions.
>
> "On the negative side, sealed bidding can place the smaller operator or firm at a disadvantage, since he doesn't know if he is going to end up acquiring leases on all or none of his bids. In contrast, in the oral auction, one can set a maximum limit in terms of total purchases, and know when to stop bidding."

*A. Oral Auction.

1. Fish, Wildlife, and Parks Dept., Fish and Game Commission, or Board of Land Commissioners.

Of course, the objectives in managing DFWP lands go beyond the financial. If leasing is occurring at a restrained pace, some of the disadvantages cited for the sealed bid approach would not apply. Either alternative, however, essentially prohibits selection of the lessee on grounds other than financial. In other words, going to a bidding process means the high bidder will get the lease, and it implies that bidding will be on the basis of a common numeraire, i.e. money. This is in contrast to the negotiation alternative, below, which might allow room to select the lessee on the basis of non-monetary commitments, such as a reclamation plan, or mitigation through the provision of other fish, wildlife, or recreational resources.

A lease auction requires rules, public notification, and administration at the auction itself. If the selection is based strictly on the highest bid, there is probably no compelling argument for either0 DFWP, the Commission, or the Board of Land Commissioners to administer it. Administrative convenience should probably rule. The Board of Land Commissioners currently holds four oil and gas lease auctions per year, and the mechanics are already in place.

*B. Negotiation.

Negotiation offers something not offered by a competitive bidding process. That is, it allows room for selection of the lessee on the basis of non-monetary factors. For example, a negotiated lease might permit the department to accept land for wildlife habitat, surface easements for habitat or hunter/fisherman access on new lands, or other lands or improvements which would directly benefit fish and wildlife purposes. Because the principal land management objectives of DFWP lands are other than producing revenue, both negotiation alternatives presented here should be given serious consideration.

1. Individually by tract.

One of the disadvantages is that the department may obtain less than the full market value for its oil and gas. This risk could perhaps be diminished by negotiation "competitively" with any parties which express an interest in a tract. In cases where the department owns a small tract surrounded by a block held by a single party, and where surface occupancy will not be permitted, there may well be only one party interested in the lease anyway.

Public officials should be aware of the risk of the "appearance of impropriety" that could result in such negotiations, and would probably want to establish procedures involving a multi-member negotiating team to protect against such charges.

On a large scale, i.e. with a large number of tracts up for lease, the negotiating alternative would probably be prohibitively costly--in time and manpower.

On the other hand, where the fish, wildlife, and recreational stakes are0 high, it might be the ideal solution.

2. Master lease agreement for all tracts.

Entering into a master lease agreement would entail identifying all tracts which would be considered for lease, and negotiating a single agreement with a single party for the lease of all the tracts.

Such an approach, while very unconventional in respect to current practices of public land management agencies, does offer the potential of some distinct advantages to the department.

First, it would allow the department to deal directly with one party. In a situation involving a large number of tracts, the burden of keeping a large number of lessees informed with respect to stipulations, rules, and operating practices on departmental lands could be substantial. Even if a lessee were allowed to enter farmout agreements with other firms, and contract with independent drilling companies, a master lease agreement would still place upon the primary lessee the obligation to ensure compliance with terms of the lease.

Second, it would provide much greater flexibility than in the single tract case, discussed above, to acquire a major addition to fish and wildlife resources managed by the department. For example, the scale of a major master lease agreement might be such that the bonus for the lease could be a major ranch in fee ownership or surface easements for game range, calving, or similar purposes.

Third, an agreement to take land rather than dollars would avoid putting the department in the business of going out and purchasing land, thus avoiding additional administrative and other headaches.

If possible, a master lease agreement on terms favorable to the department could be quite advantageous to the principal land management objectives. Terms could be negotiated to protect and enhance those values on particular tracts, and a closer relationship between DFWP personnel and the lessee could develop.

The concept does, however, pose two major concerns.

First, would the department receive full market value for a diverse and diffuse collection of tracts from one non-competitive bidder. It is likely that a firm would look over the entire list and see within it one or a few prospects of real interest. Since the master lease agreement would be a package deal to take all the tracts, the bidder might have a tendency to bid only slightly more for the entire package than it thought the tract(s) of interest would be worth. Thus the state would risk receiving less than the full market value of the properties.

Second, since in practical terms it is doubtful that any one firm would be interested in or able to develop all these tracts itself, the lessee would probably want to farm out tracts to other firms. If so, would the apparent land management advantages to the department actually occur? Furthermore, would the lessee obtain the lease at less than full market value and then capture the lease's economic rent through a farmout agreement?

The concept of a master lease agreement is very interesting, but the factors mentioned above should be carefully considered before entering into an agreement.

Lease Administration.

Managing a leasing program requires a certain amount of oversight and paperwork. Typically, mineral leases on public lands have very explicit requirements for the payment of rentals, for example. If rental payments are not received by the date due, the lease is automatically canceled. Good management of a leasing program requires very accurate record-keeping and monitoring to ensure that all relevant terms and conditions of leasing are met, and that the public interest is adequately protected.

A. Fish, Wildlife, and Parks.

If leasing is at a moderate level, it would probably be a relatively routine matter for DFWP personnel to monitor payments and record-keeping. In any case, the possible effects of physical activity on the lease should be monitored by DFWP field personnel to ensure that conditions or stipulations are complied with.

B. Department of State Lands.

Leasing on more than a very moderate level involves a considerable obligation of record-keeping and administrative monitoring. The Department of State Lands currently administers over 11,000 oil and gas leases. DSL is also evaluating several facets of their operation in terms of suitability for automation.

Assuming that a cooperative agreement could be worked out between DFWP and DSL to have DSL administer the leases, it would probably be advantageous to DFWP to be freed of the burden. Such a cooperative agreement would address record-keeping, handling of funds, periodic reporting to DFWP, and procedures for policing lease terms to ensure full compliance, e.g. requiring rental payments be made on time.

VII. APPENDIX

APPENDIX A. PERTINENT SECTIONS OF STATE LAW

87-1-209. Acquisition and sale of lands or waters. (1) The department, with the consent of the commission and, in the case of land acquisition involving more than 100 acres or $100,000 in value, the approval of the board of land commissioners, may acquire by purchase, lease, agreement, gift, or devise and may acquire easements upon lands or waters for the purposes listed in this subsection. The department may develop, operate, and maintain acquired lands or waters:

(a) for fish hatcheries, nursery ponds, or game farms;

(b) as lands or water suitable for game, bird, fish, or fur-bearing animal restoration, propagation, or protection;

(c) for public hunting, fishing, or trapping areas;

(d) to capture, propagate, transport, buy, sell, or exchange any game, birds, fish, fish eggs, or fur-bearing animals needed for propagation or stocking purposes or to exercise control measures of undesirable species;

(e) for state parks and outdoor recreation;

(f) to extend and consolidate by exchange, lands or waters suitable for these purposes.

(2) The department, with the consent of the commission, may acquire by condemnation lands or structures for the preservation of historical or archaeological sites that are threatened with destruction or alteration.

(3) (a) The department, with the consent of the commission, may dispose of lands and waters acquired by it on those terms after that public notice, without regard to other laws which provide for sale or disposal of state lands and with or without reservation, as it considers necessary and advisable.

(b) Notice of sale describing the lands or waters to be disposed of shall be published once a week for 3 successive weeks in a newspaper with general circulation printed and published in the county where the lands or waters are situated or, if no newspaper is published in that county, then in any newspaper with general circulation in that county.

(c) The notice shall advertise for cash bids to be presented to the director within 30 days from the date of the first publication. Each bid must be accompanied by a cashier's check or cash deposit in an amount equal to 10% of the amount bid. The highest bid shall be accepted upon payment of the balance due within 10 days after mailing notice by registered or certified mail to the highest bidder. If that bidder defaults on payment of the balance due, then the next highest bidders shall be similarly notified in succession until a sale is completed. Deposits shall be returned to the unsuccessful bidders except bidders defaulting after notification.

(d) The department shall reserve the right to reject any bids which do not equal or exceed the full market value of the lands and waters as determined by the department. The department shall convey the lands and waters without covenants of warranty by deed executed by the governor or in his absence or disability by the lieutenant governor, attested by the secretary of state and further countersigned by the director.

(4) Notwithstanding the provisions of 18-4-102, the department, with the consent of the commission, is authorized to utilize the installment contract method to facilitate the acquisition of wildlife management areas, in which game and nongame fur-bearing animals and game and nongame birds may breed and replenish, and areas which provide access to fishing sites for the public. In

no case may the total cost of such installment contracts exceed the cost of purchases authorized by the department and appropriated by the legislature.

87-1-601. Use of fish and game money. (1) All money collected or received from the sale of hunting and fishing licenses or permits, from the sale of seized game or hides, or from damages collected for violations of the fish and game laws of this state, from appropriations, or received by the department from any other state source shall be turned over to the state treasurer and placed by him in the earmarked revenue fund to the credit of the department. Any money received from federal sources shall be deposited in the federal and private revenue fund to the credit of the department.

(2) That money shall be exclusively set apart and made available for the payment of all salaries, per diem, fees, expenses, and expenditures authorized to be made by the department under the terms of this title. That money shall be spent for those purposes by the department, subject to appropriation by the legislature.

(3) Any reference to the fish and game fund in this code means fish and game money in the earmarked revenue fund and federal and private revenue fund.

(4) All money collected or received from fines and forfeited bonds relating to violations of state fish and game laws under Title 87 shall be deposited by the state treasurer and credited to the department of fish, wildlife, and parks in an earmarked revenue fund account for this purpose. Out of any fine imposed by a court for the violation of the fish and game laws, the costs of prosecution shall be paid to the county where the trial was held in any case where the fine is not imposed in addition to the costs of prosecution.

(5) Money received by the department from the sale of surplus real property; exploration or development of oil, gas, or mineral deposits from lands acquired by the department except royalties or other compensation based on production; and from leases of interests in department real property not contemplated at the time of acquisition shall be deposited in an account within the trust and legacy fund of the state treasury. The interest derived therefrom, but not the principal, may be used only for the purpose of operation, development, and maintenance of real property of the department, and only upon appropriation by the legislature. If the use of money as set forth herein would result in violation of applicable federal laws or state statutes specifically naming the department or money received by the department, then the use of this money must be limited in the manner, method, and amount to those uses that do not result in such violation.

23-1-102. Powers and duties of department of fish, wildlife, and parks. The department shall make a study to determine the scenic, historic, archaeologic, scientific, and recreational resources of the state and may by purchase, lease, agreement, acceptance of donations, or condemnation for the purposes outlined in 87-1-209(2) acquire for the state any areas, sites, or objects which in its opinion should be held, improved, and maintained as state parks, state recreational areas, state monuments, or state historical sites. The department may in its discretion accept in the name of the state, in fee or otherwise, any areas, sites, or objects conveyed, entrusted, donated, or devised to the state. It may in its discretion accept gifts, grants, bequests, or contributions of money or other property to be spent or used for any of the purposes of this part. A contract, for any of the purposes of this part, may not be entered into or other obligation incurred until moneys have been appropriated by the legislature or are otherwise available and, if the contract or obligation pertains to acquisition of areas or sites in excess of either 100 acres or $100,000 in value, until the board of land commissioners has specifically approved such acquisition. The department also has jurisdiction, custody, and control of all state parks, recreational areas, public camping grounds, historical sites, and monuments, except wayside camps and other public conveniences acquired, improved, and maintained by the department of highways and contiguous to the state highway system. The department may designate lands under its control as state parks, state historical sites, state monuments, or by any other designation it considers appropriate, remove or change the designation of any area or portion, and name or change the name of any area as designated. The department may lease those portions of designated lands which are necessary for the proper administration of these lands in keeping with the basic purposes of this part.

23-1-103. Acceptance of title to recreational and camping grounds by board of land commissioners. The state board of land commissioners may acquire and accept title in the name of the state of Montana by grant, dedication, gift, devise, donation, or demise to land suitable for public camping and public recreational use. The state board of land commissioners is hereby authorized to set aside any suitable tract or tracts of state lands for such purpose. Each of the aforesaid tracts of land shall be set aside and used exclusively for public camping and other recreational purposes, and each park created under the provisions of this section shall be given an appropriate name by the state board of land commissioners.

23-2-102. Department of fish, wildlife, and parks to implement federal acts. The department of fish, wildlife, and parks is hereby designated as the state agency to represent and act for the state for the purpose of implementing the Land and Water Conservation Fund Act of 1965.

23-2-103. Compliance with federal act authorized -- powers of department. The department of fish, wildlife, and parks shall do those things necessary to comply with the provisions of the Land and Water Conservation Fund Act of 1965. Among other things, the department of fish, wildlife, and parks may:

(1) prepare a comprehensive statewide outdoor recreational plan which shall contain an evaluation of demand for and supply of outdoor recreational resources and facilities in Montana and a program for implementation of the plan;

(2) accept and administer moneys paid by the secretary of the interior for approved projects;

(3) contract with other state agencies, cities, counties, and other political subdivisions of the state, private organizations, and agencies of the federal government;

(4) acquire, other than by eminent domain, and develop outdoor recreational areas and facilities and land and waters and interests in land and waters for such areas and facilities;

(5) for the purpose of implementing the Land and Water Conservation Fund Act of 1965, coordinate its activities with and represent the interests of all agencies of state, city, county, and other governmental units with outdoor recreational responsibilities.

APPENDIX B. LEASING POLICY COMPARISONS

Several states were surveyed to determine the leasing policies in effect on lands managed by fish and wildlife agencies in other states. Following are the summary forms for each responding state as well as the blank survey form which was sent.

States responding to the mail survey were:

Colorado

Idaho

Louisiana

New Mexico

Oregon

Pennsylvania

Washington

In addition, appropriate officials from the States of North Dakota and Wyoming were interviewed by phone.

More detailed information is available in the file materials transmitted to the Department by The Meadowlark Group.

LEASE POLICY SUMMARY

STATE: Colorado

ADMINISTERED BY:

Colorado Division of Wildlife
Department of Natural Resources
6060 Broadway
Denver, Colorado 80216
303-825-1192 X244

OIL AND GAS LEASING TERMS

1. Royalty Rate.

   A. Oil: 1/6 (16.67%)

   B. Gas: 1/6 (16.67%)

2. Annual Rental Rate: $1.00/acre, 1st year. $2.00/acre, 2nd year if no

drilling in 1st year; $4.00/acre, 3rd year if no drilling in 2nd year.

3. Lease Duration: 3 Years.

4. Limitations on surface activity.

No drilling leases are common.

A. When is surface occupancy allowed? Determined by field personnel after inspecting property.

B. Other limitations: Drilling can be restricted or prohibited during certain periods where and when it conflicts with wildlife and/or habitat.

5. Provisions for protecting and reclaiming land surface: Specifically identified in lease. Per acre value for damage identified in lease.

6. Do leasing provisions vary for different classes of land? No.

7. Lease Acquisition Method.

Applicant agrees to lease stipulations, i.e. rental, term, royalty, etc. and offers a "competitive" bonus bid. Lease is auctioned at State Land Board public auction beginning with bonus bid offered by applicant. High bonus bidder awarded lease. If no bids are received at auction, applicant is considered high bidder with his bonus bid offer.

8. Use of Royalties, Rentals, and Bonuses.

Revenues are credited against the federal aid project if applicable. If not federal aid properties, rents and royalty go into the game cash fund.

9. Acres currently under oil and gas lease.

866.98 net mineral acres from 5 oil and gas leases.

10. Additional comments.

The lease provides for shut-in royalty of double the last annual rental.

The successful bidder for the lease is required to provide a mineral interest title opinion of the leased lands.

LEASE POLICY SUMMARY

STATE: Idaho

ADMINISTERED BY:

Idaho Department of Fish and Game
P.O. Box 25
600 South Walnut
Boise, ID 83707
208-334-3730

OIL AND GAS LEASING TERMS

1. Royalty Rate.

A. Oil: 1/8 (12.5%)

B. Gas: 1/8 (12.5%)

2. Annual Rental Rate: $1.00/acre.

3. Lease Duration: 10 Years.

4. Limitations on surface activity.

A. When is surface occupancy allowed? When the activity will not be in conflict with the purposes for which the land was acquired.

B. Other limitations: Certain periods of the year may be restricted from surface activity.

5. Provisions for protecting and reclaiming land surface:

No reply.

6. Do leasing provisions vary for different classes of land?

A. Acquired under P-R/D-J: Yes, depending on whether big game or waterfowl addition.

B. Land and Water Conservation: Yes, same as above.

C. Other: Yes, same as above.

7. Lease Acquisition Method.

Competitive oral auction, bonus bidding.

8. Use of Royalties, Rentals, and Bonuses.

	P-R/D-J Lands	LWCF Lands	Parks	Fishing Sites	Other
Royalty	75% to PR/DJ Project; 25% to Fish & Game General Fund				
Rental	"				
Bonus	"				
Other	"				

9. Acres currently under oil and gas lease. 11,080 acres.

10. Additional comments.

LEASE POLICY SUMMARY

STATE: Louisiana

ADMINISTERED BY:

Mr. Hugh Bateman, Assistant Federal Aid Coordinator
Louisiana Department of Wildlife and Fisheries
P.O. Box 14526, SE Station
Baton Rouge, Louisiana 70898
504-342-5868

OIL AND GAS LEASING TERMS

1. Royalty Rate.
    - A. Oil: Varies, 1/6 to 1/5, some as high as 40%
    - B. Gas: Varies, same as oil.
2. Annual Rental Rate: Highly variable, $50.00 to $3,000 per acre.
3. Lease Duration: Varies, usually 3 Years.

4. Limitations on surface activity.

A. When is surface occupancy allowed? It is generally allowed, but extensive and detailed regulations apply.

B. Other limitations: After a lease has been granted, the lessee must comply with detailed regulations. They cover well location, time and route of access, protection against spills of hydrocarbons and drilling fluids, fire safety, siting and burial of pipes, protection of natural drainageways, site cleanup within 30 days of drilling completion, and site restoration at abandonment.

Permittee is required to restore, repair, or mitigate in full, all damages to Department property that result directly or indirectly from the permitted activity.

5. Provisions for protecting and reclaiming land surface: See point 4 above and concluding comment.

6. Do leasing provisions vary for different classes of land? Yes, but only as far as regulations are concerned.

7. Lease Acquisition Method. All oil and gas leasing procedures are handled by the State Mineral Board, an arm of the Louisiana Department of Natural Resources. In general, the following procedure is followed:

A. A tract of Department owned property is advertised over a 30 day period through the State Mineral Board. This results from a request by the State Agency owning the property or by a private individual or company who is interested in a particular tract of land.

B. Sealed bids are received by the Mineral Board which are opened and announced at a public hearing. These bids normally include a cash bonus for a 3 year lease plus a percent royalty of any minerals produced.

C. The high bidder, if approved by the State Agency owning the property, is then awarded a lease. In the case of the Department of Wildlife and Fisheries, the lessee must then also obtain all conditional permits required to explore for oil and gas on the property in question.

8. Use of Royalties, Rentals, and Bonuses. Mineral income normally goes back into the Conservation Fund for use by the entire Department during the next fiscal year. The State also has two special funds established by the Legislature where mineral income is allowed to accumulate up to a certain amount. Then the interest from the fund is used to operate that refuge. Two coastal refuges, Marsh Island and Rockefeller, are operated under this arrangement. Funds are also used from these two special sources for land acquisition, information-education, and public health.

9. Acres currently under oil and gas lease. The Department has several hundred thousand acres under lease. The actual figure changes almost monthly.

10. Additional comments.

Several aspects of Louisiana's leasing program stand out.

First, it is a very large-scale operation which involves substantial coastal marsh wetlands. The environmental conditions there are considerably different from inland forested areas.

Second, the Department relies heavily on the professional staff of the State Mineral Board, including geologists, engineers, and attorneys. This staff advises on details of leasing arrangements, royalty agreements and other questions regarding minerals.

Third, the financial dimensions are also substantial. In a typical month, from February 16 to March 15, 1982, the Department collected the following royalties:

Group A, Pass A Loutre Waterfowl Hunting Area	$1,005,309.20
Group B, Marsh Island Refuge	14,775.54
Group C, Rockefeller Preserve	2,180,266.80
TOTAL	3,200,351.54

LEASE POLICY SUMMARY

STATE: New Mexico

ADMINISTERED BY:

Marshall C. Conway, Project Leader, Development
New Mexico Department of Game and Fish
Villagra Building, Santa Fe, New Mexico
505-827-2438

OIL AND GAS LEASING TERMS

1. Royalty Rate.

   A. Oil: 3/16 (18.75%)

   B. Gas: 3/16 (18.75%)

2. Annual Rental Rate: $1.00/acre.

3. Lease Duration: 5 Years.

4. Limitations on surface activity.

   None cited.

5. Provisions for protecting and reclaiming land surface:

None cited.

6. Do leasing provisions vary for different classes of land? No.

7. Lease Acquisition Method.

Sealed bid. Advertised and administered by State Land Office.

8. Use of Royalties, Rentals, and Bonuses.

Deposited in Game Protection Fund.

9. Acres currently under oil and gas lease. 823 acres.

10. Additional comments.

None cited.

LEASE POLICY SUMMARY

STATE: North Dakota

ADMINISTERED BY:

Mike McKenna, Natural Resources Coordinator
North Dakota Game and Fish Department
2121 Lovett Ave., Bismarck, ND 58505
701-224-2180

OIL AND GAS LEASING TERMS

1. Royalty Rate.

   A. Oil: NA

   B. Gas: NA

2. Annual Rental Rate: NA

3. Lease Duration: NA

4. COMMENT.

The State of North Dakota owns essentially no minerals, and has not faced any development. They do assess a damage payment for surface use and impacts.

LEASE POLICY SUMMARY

STATE: Oregon

ADMINISTERED BY:

Oregon Department of Fish and Wildlife
P.O. Box 3503
506 S.W. Mill Street
Portland, Oregon 97208
503-229-5551

OIL AND GAS LEASING TERMS

1. Royalty Rate.

   A. Oil: 1/8 (12.5%)

   B. Gas: 1/8 (12.5%)

2. Annual Rental Rate: 1.00/acre. Can go as high as $150.00/acre, depending on the site.

3. Lease Duration: 10 Years.

4. Limitations on surface activity.

   A. When is surface occupancy allowed? It is not allowed except for seismic exploration.

   B. Other limitations: No drilling occupancy has been allowed. Drilling must be accomplished by offset or slant drilling from adjacent property.

5. Provisions for protecting and reclaiming land surface:

   No surface occupancy has been allowed to date.

6. Do leasing provisions vary for different classes of land? No.

7. Lease Acquisition Method.

   Competitive Auction, conducted by the Oregon Division of State Lands. For this service they assess the Department 10 percent of the bonus and the annual lease payment.

8. Use of Royalties, Rentals, and Bonuses.

   No reply.

9. Acres currently under oil and gas lease.

No reply.

10. Additional comments.

Bonus per acre has ranged from $23 to $216.

LEASE POLICY SUMMARY

STATE: Pennsylvania

ADMINISTERED BY:

John O. Hoffman, Chief, Real Estate Division
Pennsylvania Fish Commission
P.O. Box 1673, Harrisburg, Pennsylvania 17129
717-787-6376

OIL AND GAS LEASING TERMS

1. Royalty Rate.

   A. Oil: 1/8 (12.5%)

   B. Gas: 1/8 (12.5%) or
   .06 cents/MCF

2. Annual Rental Rate: $1.00/acre, $35.00 first year.

3. Lease Duration: 10 Years.

4. Limitations on surface activity.

   A. When is surface occupancy allowed? Never.

   B. Other limitations: Off set drilling only.

5. Provisions for protecting and reclaiming land surface:

   Surface occupancy is never permitted.

6. Do leasing provisions vary for different classes of land? No.

7. Lease Acquisition Method.

   Negotiation.

8. Use of Royalties, Rentals, and Bonuses.

	P-R/D-J Lands	LWCF Lands	Parks	Fishing Sites	Other
Royalty	D-J Program Income FMC 74-7-E	LWCF Program Income FMC 74-7-E	N.A.	Fish or Boat Fund	Fish/ Boat Fund
Rental	"	"	"	"	"
Bonus	"	"	"	"	"
Other	"	"	"	"	"

9. Acres currently under oil and gas lease. 468.291 Acres.

10. Additional comments.

Income is allocated to Fish Fund or Boat Fund, depending upon the source of moneys used for land acquisition.

LEASE POLICY SUMMARY

STATE: Washington

ADMINISTERED BY:

Robert H. Barnard
Lands Program Manager/Oil and Gas Coordinator
Washington Department of Game
600 North Capitol Way
Olympia, Washington 98504
206-753-5792

OIL AND GAS LEASING TERMS

1. Royalty Rate. Variable

   A. Oil: State minimum is 12.5%

   B. Gas: State minimum is 12.5%

2. Annual Rental Rate: State minimum is $1.25/acre

3. Lease Duration: 5 Years.

4. Limitations on surface activity.

A. Although the Department has not entered into any leases at this time, the programmatic EIS expressed two alternatives to leasing. They are:

(1) Prohibiting surface disturbance or occupancy on specific tracts; and
(2) Disapproval of leasing on all or specific tracts.

5. Provisions for protecting and reclaiming land surface:

The task force discussed in 10 (below) is currently developing a possible lease form which will address this.

6. Do leasing provisions vary for different classes of land?

A. Acquired under P-R/D-J:

Revenue credited to and used in program.

B. Land and Water Conservation:

Income must be used for recreation enhancement.

C. Other: Game fund purchased and managed lands - agency has full authority for use of income.

7. Lease Acquisition Method.

State standard is oral auction process.

8. Use of Royalties, Rentals, and Bonuses.

See number 6, preceding page.

9. Acres currently under oil and gas lease.

None.

10. Additional comments.

Although no Department lands are currently under lease, the Department has been deeply involved in the hydrocarbon leasing program in Washington State since early 1979. In April of that year, Shell Oil Company applied for leases on approximately 63,000 acres of department-owned land. As part of the lease consideration process, the department has either completed or continued participation in a number of comprehensive studies. In 1981 the Department completed a programatic environmental impact statement on the 63,000 application acres.

The Department policy on hydrocarbon leasing can be briefly summarized as follows: (1) leasing must result in net benefits to fish and wildlife resources, (2) adequate habitat and environmental protection measures can and will be employed, and (3) State Environmental Policy Act and all appropriate state and federal laws will be complied with fully.

The Department is currently preparing a supplemental site specific EIS on a 14,000 acre land unit near Yakima, in the event lease authority is secured this fall from the Game Commission.

In December of 1981 the Department formed an oil and gas task force to assist the department in making leasing decisions.

LEASE POLICY SUMMARY

STATE: Wyoming

ADMINISTERED BY:

Chester Anderson, Chief, Research and Development
Wyoming Game and Fish Department
5400 Bishop Boulevard, Cheyenne, Wyoming, 82002
307-777-7631

OIL AND GAS LEASING TERMS

1. Royalty Rate.
   - A. Oil: 16 2/3%
   - B. Gas: 16 2/3 %
2. Annual Rental Rate: $1.00 / Acre.
3. Lease Duration: 5 Years.
4. Limitations on surface activity.
   - A. Varies with stipulations. See comment below.
5. Provisions for protecting and reclaiming land surface:
6. Do leasing provisions vary for different classes of land?
   - A. No. They are all determined by the Land Board.

7. Lease Acquisition Method.

An interested developer or broker submits a lease application, after which the Game and Fish Department is asked by the Land Board whether they recommend whether or not to lease, and if so, under what stipulations. If it is leased, it goes into the Wyoming simultaneous filing ("lottery") process.

8. Use of Royalties, Rentals, and Bonuses.

The Land Board receives the filing fee and the Game and Fish Department gets the lease rental and the royalty. On Federal Aid projects, 75% of the revenues are credited to the Federal Aid fund, while the other 25% goes into the Game and Fish general fund.

9. Acres currently under oil and gas lease. Approximately 5,000.

The Department has an interest in about 120,000 acres, but has total ownership (100%) in less than 10,000 acres. They have partial mineral ownership in less than 40,000 acres.

10. Additional comments.

Interest in leasing has been increasing. Seismograph activity has been driving them crazy. Seismic applications have jumped from one or two per year to one or two per week.

LEASE POLICY SUMMARY (blank form)

STATE:

ADMINISTERED BY:

Official, title
Agency
Address
Telephone

OIL AND GAS LEASING TERMS

1. Royalty Rate.

    A. Oil:

    B. Gas:

2. Annual Rental Rate: $ /Acre.

3. Lease Duration: Years.

4. Limitations on surface activity.

    A. When is surface occupancy allowed?

    B. Other limitations:

5. Provisions for protecting and reclaiming land surface:

6. Do leasing provisions vary for different classes of land?

    A. Acquired under P-R/D-J:

    B. Land and Water Conservation:

    C. Other:

7. Lease Acquisition Method (specify and describe--eg. oral auction, sealed bid, negotiation).

8. Use of Royalties, Rentals, and Bonuses.
(Specify purposes for which oil and gas revenues are used in your state, e.g. state general fund, permanent school trust fund, park/habitat acquisition, resource management. Please note how this varies with different categories of land.)

	P-R/D-J Lands	LWCF Lands	Parks	Fishing Sites	Other
Royalty					
Rental					
Bonus					
Other					

9. Acres currently under oil and gas lease.

10. Additional comments (use more space if needed)

(Please include copies of pertinent laws, policies, or reports.)

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  ¶   A   ¶¶    B   ¶¶    C   ¶¶   D   ¶¶    E    ¶¶     F   ¶¶     G   ¶¶     H   ¶¶     I   ¶¶     J   ¶¶    K   ¶¶     L   ¶
 1¶YEAR       TOT ACRE NEW ACRE AV CONSIDCONSID   OLD RENT NEW RENT RENT      BONUSES   DD ACRES DD PENS   INCOME
 2¶
 3¶     1983   1562.5    1562.5      9.65 15078.13        0  2343.75  2343.75 12734.38         0         0 15078.13
 4¶     1984     3125    1562.5      9.65 15078.13  2343.75  2343.75   4687.5 12734.38         0         0 17421.88
 5¶     1985   4687.5    1562.5      9.65 15078.13   4687.5  2343.75  7031.25 12734.38         0         0 19765.63
 6¶     1986     6250    1562.5      9.65 15078.13  7031.25  2343.75     9375 12734.38         0         0 22109.38
 7¶     1987   7812.5    1562.5      9.65 15078.13     9375  2343.75 11718.75 12734.38         0         0 24453.13
 8¶     1988     9375    1562.5      9.65 15078.13 11718.75  2343.75  14062.5 12734.38    1562.5 1953.125     28750
 9¶     1989  10937.5    1562.5      9.65 15078.13  14062.5  2343.75 16406.25 12734.38      3125  3906.25 33046.88
10¶     1990    12500    1562.5      9.65 15078.13 16406.25  2343.75    18750 12734.38    4687.5 5859.375 37343.75
11¶     1991    12500    1562.5      9.65 15078.13 16406.25  2343.75    18750 12734.38    4687.5 5859.375 37343.75
12¶     1992    12500    1562.5      9.65 15078.13 16406.25  2343.75    18750 12734.38    4687.5 5859.375 37343.75
13¶     1993    12500    1562.5      9.65 15078.13 16406.25  2343.75    18750 12734.38    4687.5 5859.375 37343.75
14¶     1994    12500    1562.5      9.65 15078.13 16406.25  2343.75    18750 12734.38    4687.5 5859.375 37343.75
15¶     1995    12500    1562.5      9.65 15078.13 16406.25  2343.75    18750 12734.38    4687.5 5859.375 37343.75
16¶     1996    12500    1562.5      9.65 15078.13 16406.25  2343.75    18750 12734.38    4687.5 5859.375 37343.75
17¶     1997    12500    1562.5      9.65 15078.13 16406.25  2343.75    18750 12734.38    4687.5 5859.375 37343.75
18¶     1998    12500    1562.5      9.65 15078.13 16406.25  2343.75    18750 12734.38    4687.5 5859.375 37343.75
19¶     1999    12500    1562.5      9.65 15078.13 16406.25  2343.75    18750 12734.38    4687.5 5859.375 37343.75
20¶     2000    12500    1562.5      9.65 15078.13 16406.25  2343.75    18750 12734.38    4687.5 5859.375 37343.75
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Scenario 1
Page 1

Scenario 1
Page 2

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   ¶    M    ¶¶    N    ¶¶    O    ¶¶    P    ¶¶    Q    ¶¶    R    ¶
  1¶O PROD     O ROYAL   G PROD     G ROYAL   ALL ROYALTOT REV
  2¶
  3¶          0        0         0        0        0 15078.13
  4¶          0        0         0        0        0 17421.88
  5¶          0        0         0        0        0 19765.63
  6¶          0        0         0        0        0 22109.38
  7¶          0        0         0        0        0 24453.13
  8¶ 820.3125 3588.867 1640.625 568.0664 4156.934 32906.93
  9¶ 1914.063 8374.023 3828.125 1325.488 9699.512 42746.39
 10¶  3281.25 14355.47   6562.5 2272.266 16627.73 53971.48
 11¶     4375 19140.63     8750 3029.688 22170.31 59514.06
 12¶  5468.75 23925.78  10937.5 3787.109 27712.89 65056.64
 13¶  5468.75 23925.78  10937.5 3787.109 27712.89 65056.64
 14¶  5468.75 23925.78  10937.5 3787.109 27712.89 65056.64
 15¶  5468.75 23925.78  10937.5 3787.109 27712.89 65056.64
 16¶  5468.75 23925.78  10937.5 3787.109 27712.89 65056.64
 17¶  5468.75 23925.78  10937.5 3787.109 27712.89 65056.64
 18¶  5468.75 23925.78  10937.5 3787.109 27712.89 65056.64
 19¶  5468.75 23925.78  10937.5 3787.109 27712.89 65056.64
 20¶  5468.75 23925.78  10937.5 3787.109 27712.89 65056.64
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  ¶   A    ¶¶   B   ¶¶   C   ¶¶   D   ¶¶   E    ¶¶   F   ¶¶   G   ¶¶   H    ¶¶   I   ¶¶  J   ¶¶   K   ¶¶   L   ¶
 1¶YEAR      TOT ACRE NEW ACRE AV CONSIDCONSID    OLD RENT NEW RENT RENT      BONUSES  DD ACRES DD PENS   INCOME
 2¶
 3¶     1983     3125     3125      9.65 30156.25        0   4687.5   4687.5 25468.75        0         0 30156.25
 4¶     1984     6250     3125      9.65 30156.25   4687.5   4687.5     9375 25468.75        0         0 34843.75
 5¶     1985     9375     3125      9.65 30156.25     9375   4687.5  14062.5 25468.75        0         0 39531.25
 6¶     1986    12500     3125      9.65 30156.25  14062.5   4687.5    18750 25468.75        0         0 44218.75
 7¶     1987    15625     3125      9.65 30156.25    18750   4687.5  23437.5 25468.75        0         0 48906.25
 8¶     1988    18750     3125      9.65 30156.25  23437.5   4687.5    28125 25468.75     3125   3906.25    57500
 9¶     1989    21875     3125      9.65 30156.25    28125   4687.5  32812.5 25468.75     6250    7812.5 66093.75
10¶     1990    25000     3125      9.65 30156.25  32812.5   4687.5    37500 25468.75     9375  11718.75  74687.5
11¶     1991    25000     3125      9.65 30156.25  32812.5   4687.5    37500 25468.75     9375  11718.75  74687.5
12¶     1992    25000     3125      9.65 30156.25  32812.5   4687.5    37500 25468.75     9375  11718.75  74687.5
13¶     1993    25000     3125      9.65 30156.25  32812.5   4687.5    37500 25468.75     9375  11718.75  74687.5
14¶     1994    25000     3125      9.65 30156.25  32812.5   4687.5    37500 25468.75     9375  11718.75  74687.5
15¶     1995    25000     3125      9.65 30156.25  32812.5   4687.5    37500 25468.75     9375  11718.75  74687.5
16¶     1996    25000     3125      9.65 30156.25  32812.5   4687.5    37500 25468.75     9375  11718.75  74687.5
17¶     1997    25000     3125      9.65 30156.25  32812.5   4687.5    37500 25468.75     9375  11718.75  74687.5
18¶     1998    25000     3125      9.65 30156.25  32812.5   4687.5    37500 25468.75     9375  11718.75  74687.5
19¶     1999    25000     3125      9.65 30156.25  32812.5   4687.5    37500 25468.75     9375  11718.75  74687.5
20¶     2000    25000     3125      9.65 30156.25  32812.5   4687.5    37500 25468.75     9375  11718.75  74687.5
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Scenario 2
Page 1

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   ¶     M     ¶¶    N     ¶¶    O     ¶¶    P     ¶¶     Q     ¶¶    R     ¶
  1¶O  PROD     O  ROYAL   G  PROD    G  ROYAL   ALL  ROYALTOT  REV
  2¶
  3¶           0           0           0           0           0  30156.25
  4¶           0           0           0           0           0  34843.75
  5¶           0           0           0           0           0  39531.25
  6¶           0           0           0           0           0  44218.75
  7¶           0           0           0           0           0  48906.25
  8¶ 1640.625  7177.734     3281.25  1136.133  8313.867  65813.87
  9¶ 3828.125  16748.05     7656.25  2650.977  19399.02  85492.77
 10¶   6562.5  28710.94       13125  4544.531  33255.47  107943.0
 11¶     8750  38281.25       17500  6059.375  44340.63  119028.1
 12¶  10937.5  47851.56       21875  7574.219  55425.78  130113.3
 13¶  10937.5  47851.56       21875  7574.219  55425.78  130113.3
 14¶  10937.5  47851.56       21875  7574.219  55425.78  130113.3
 15¶  10937.5  47851.56       21875  7574.219  55425.78  130113.3
 16¶  10937.5  47851.56       21875  7574.219  55425.78  130113.3
 17¶  10937.5  47851.56       21875  7574.219  55425.78  130113.3
 18¶  10937.5  47851.56       21875  7574.219  55425.78  130113.3
 19¶  10937.5  47851.56       21875  7574.219  55425.78  130113.3
 20¶  10937.5  47851.56       21875  7574.219  55425.78  130113.3
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  ¶   A    ¶¶   B    ¶¶   C    ¶¶   D    ¶¶   E     ¶¶   F    ¶¶   G    ¶¶   H    ¶¶   I     ¶¶   J    ¶¶   K    ¶¶   L     ¶
 1¶YEAR       TOT ACRE NEW ACRE AV CONSIDCONSID   OLD RENT NEW RENT RENT      BONUSES  DD ACRES DD PENS   INCOME
 2¶
 3¶      1983      6250      6250      9.65  60312.5         0      9375      9375  50937.5        0         0   60312.5
 4¶      1984     12500      6250      9.65  60312.5      9375      9375     18750  50937.5        0         0   69687.5
 5¶      1985     18750      6250      9.65  60312.5     18750      9375     28125  50937.5        0         0   79062.5
 6¶      1986     25000      6250      9.65  60312.5     28125      9375     37500  50937.5        0         0   88437.5
 7¶      1987     31250      6250      9.65  60312.5     37500      9375     46875  50937.5        0         0   97812.5
 8¶      1988     37500      6250      9.65  60312.5     46875      9375     56250  50937.5        0         0   97812.5
 9¶      1989     43750      6250      9.65  60312.5     46875      9375     56250  50937.5     6250    7812.5    115000
10¶      1990     50000      6250      9.65  60312.5     56250      9375     65625  50937.5    12500     15625  132187.5
11¶      1991     50000      6250      9.65  60312.5     65625      9375     75000  50937.5    18750   23437.5    149375
12¶      1992     50000      6250      9.65  60312.5     65625      9375     75000  50937.5    18750   23437.5    149375
13¶      1993     50000      6250      9.65  60312.5     65625      9375     75000  50937.5    18750   23437.5    149375
14¶      1994     50000      6250      9.65  60312.5     65625      9375     75000  50937.5    18750   23437.5    149375
15¶      1995     50000      6250      9.65  60312.5     65625      9375     75000  50937.5    18750   23437.5    149375
16¶      1996     50000      6250      9.65  60312.5     65625      9375     75000  50937.5    18750   23437.5    149375
17¶      1997     50000      6250      9.65  60312.5     65625      9375     75000  50937.5    18750   23437.5    149375
18¶      1998     50000      6250      9.65  60312.5     65625      9375     75000  50937.5    18750   23437.5    149375
19¶      1999     50000      6250      9.65  60312.5     65625      9375     75000  50937.5    18750   23437.5    149375
20¶      2000     50000      6250      9.65  60312.5     65625      9375     75000  50937.5    18750   23437.5    149375
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Scenario 3
Page 1

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     ¶    M     ¶¶    N     ¶¶   O     ¶¶    P     ¶¶    Q     ¶¶    R     ¶
   1¶O  PROD     O  ROYAL    G  PROD     G  ROYAL    ALL  ROYALTOT  REV
   2¶
   3¶          0          0          0          0          0   60312.5
   4¶          0          0          0          0          0   69687.5
   5¶          0          0          0          0          0   79062.5
   6¶          0          0          0          0          0   88437.5
   7¶          0          0          0          0          0   97812.5
   8¶    3281.25   14355.47     6562.5   2272.266   16627.73  131627.7
   9¶    7656.25   33496.09    15312.5   5301.953   38798.05  170985.5
  10¶      13125   57421.88      26250   9089.063   66510.94  215885.9
  11¶      17500    76562.5      35000   12118.75   88681.25  238056.3
  12¶      21875   95703.13      43750   15148.44   110851.6  260226.6
  13¶      21875   95703.13      43750   15148.44   110851.6  260226.6
  14¶      21875   95703.13      43750   15148.44   110851.6  260226.6
  15¶      21875   95703.13      43750   15148.44   110851.6  260226.6
  16¶      21875   95703.13      43750   15148.44   110851.6  260226.6
  17¶      21875   95703.13      43750   15148.44   110851.6  260226.6
  18¶      21875   95703.13      43750   15148.44   110851.6  260226.6
  19¶      21875   95703.13      43750   15148.44   110851.6  260226.6
  20¶      21875   95703.13      43750   15148.44   110851.6  260226.6
  ¶   A   ¶¶   B   ¶¶   C   ¶¶   D   ¶¶   E    ¶¶   F   ¶¶   G   ¶¶   H   ¶¶   I   ¶¶   J   ¶¶   K   ¶¶   L    ¶
 1¶YEAR      TOT ACRE NEW ACRE AV CONSIDCONSID   OLD RENT NEW RENT RENT      BONUSES   DD ACRES DD PENS   INCOME
 2¶
 3¶      1983      3125      3125      19.3  60312.5         0   4687.5   4687.5     55625          0         0  60312.5
 4¶      1984      6250      3125      19.3  60312.5    4687.5   4687.5     9375     55625          0         0    65000
 5¶      1985      9375      3125      19.3  60312.5      9375   4687.5  14062.5     55625          0         0  69687.5
 6¶      1986     12500      3125      19.3  60312.5   14062.5   4687.5    18750     55625          0         0    74375
 7¶      1987     15625      3125      19.3  60312.5     18750   4687.5  23437.5     55625          0         0  79062.5
 8¶      1988     18750      3125      19.3  60312.5   23437.5   4687.5    28125     55625       3125   3906.25 87656.25
 9¶      1989     21875      3125      19.3  60312.5     28125   4687.5  32812.5     55625       6250    7812.5    96250
10¶      1990     25000      3125      19.3  60312.5   32812.5   4687.5    37500     55625       9375  11718.75 104843.8
11¶      1991     25000      3125      19.3  60312.5   32812.5   4687.5    37500     55625       9375  11718.75 104843.8
12¶      1992     25000      3125      19.3  60312.5   32812.5   4687.5    37500     55625       9375  11718.75 104843.8
13¶      1993     25000      3125      19.3  60312.5   32812.5   4687.5    37500     55625       9375  11718.75 104843.8
14¶      1994     25000      3125      19.3  60312.5   32812.5   4687.5    37500     55625       9375  11718.75 104843.8
15¶      1995     25000      3125      19.3  60312.5   32812.5   4687.5    37500     55625       9375  11718.75 104843.8
16¶      1996     25000      3125      19.3  60312.5   32812.5   4687.5    37500     55625       9375  11718.75 104843.8
17¶      1997     25000      3125      19.3  60312.5   32812.5   4687.5    37500     55625       9375  11718.75 104843.8
18¶      1998     25000      3125      19.3  60312.5   32812.5   4687.5    37500     55625       9375  11718.75 104843.8
19¶      1999     25000      3125      19.3  60312.5   32812.5   4687.5    37500     55625       9375  11718.75 104843.8
20¶      2000     25000      3125      19.3  60312.5   32812.5   4687.5    37500     55625       9375  11718.75 104843.8
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Scenario 4
Page 1

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  ¶   M    ¶¶   N    ¶¶   O    ¶¶   P    ¶¶   Q    ¶¶   R    ¶
 1¶O PROD     O ROYAL   G PROD     G ROYAL   ALL ROYALTOT REV
 2¶
 3¶         0         0         0         0         0  60312.5
 4¶         0         0         0         0         0    65000
 5¶         0         0         0         0         0  69687.5
 6¶         0         0         0         0         0    74375
 7¶         0         0         0         0         0  79062.5
 8¶  3281.25 14355.47    6562.5 2272.266 16627.73 104284.0
 9¶  7656.25 33496.09   15312.5 5301.953 38798.05 135048.0
10¶    13125 57421.88     26250 9089.063 66510.94 171354.7
11¶    17500  76562.5     35000 12118.75 88681.25   193525
12¶    21875 95703.13     43750 15148.44 110851.6 215695.3
13¶    21875 95703.13     43750 15148.44 110851.6 215695.3
14¶    21875 95703.13     43750 15148.44 110851.6 215695.3
15¶    21875 95703.13     43750 15148.44 110851.6 215695.3
16¶    21875 95703.13     43750 15148.44 110851.6 215695.3
17¶    21875 95703.13     43750 15148.44 110851.6 215695.3
18¶    21875 95703.13     43750 15148.44 110851.6 215695.3
19¶    21875 95703.13     43750 15148.44 110851.6 215695.3
20¶    21875 95703.13     43750 15148.44 110851.6 215695.3
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  ¶   A    ¶¶    B   ¶¶    C   ¶¶    D   ¶¶    E    ¶¶    F   ¶¶    G   ¶¶    H   ¶¶    I    ¶¶   J   ¶¶    K   ¶¶    L    ¶
 1¶YEAR       TOT ACRE NEW ACRE AV CONSIDCONSID   OLD RENT NEW RENT RENT     BONUSES   DD ACRES DD PENS   INCOME
 2¶
 3¶     1983     6250      6250     19.3   120625        0      9375     9375   111250         0         0   120625
 4¶     1984    12500      6250     19.3   120625     9375      9375    18750   111250         0         0   130000
 5¶     1985    18750      6250     19.3   120625    18750      9375    28125   111250         0         0   139375
 6¶     1986    25000      6250     19.3   120625    28125      9375    37500   111250         0         0   148750
 7¶     1987    31250      6250     19.3   120625    37500      9375    46875   111250         0         0   158125
 8¶     1988    37500      6250     19.3   120625    46875      9375    56250   111250      6250    7812.5 175312.5
 9¶     1989    43750      6250     19.3   120625    56250      9375    65625   111250     12500     15625   192500
10¶     1990    50000      6250     19.3   120625    65625      9375    75000   111250     18750   23437.5 209687.5
11¶     1991    50000      6250     19.3   120625    65625      9375    75000   111250     18750   23437.5 209687.5
12¶     1992    50000      6250     19.3   120625    65625      9375    75000   111250     18750   23437.5 209687.5
13¶     1993    50000      6250     19.3   120625    65625      9375    75000   111250     18750   23437.5 209687.5
14¶     1994    50000      6250     19.3   120625    65625      9375    75000   111250     18750   23437.5 209687.5
15¶     1995    50000      6250     19.3   120625    65625      9375    75000   111250     18750   23437.5 209687.5
16¶     1996    50000      6250     19.3   120625    65625      9375    75000   111250     18750   23437.5 209687.5
17¶     1997    50000      6250     19.3   120625    65625      9375    75000   111250     18750   23437.5 209687.5
18¶     1998    50000      6250     19.3   120625    65625      9375    75000   111250     18750   23437.5 209687.5
19¶     1999    50000      6250     19.3   120625    65625      9375    75000   111250     18750   23437.5 209687.5
20¶     2000    50000      6250     19.3   120625    65625      9375    75000   111250     18750   23437.5 209687.5
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Scenario 5
Page 1

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   ¶   M    ¶¶    N    ¶¶    O    ¶¶    P    ¶¶    Q    ¶¶    R    ¶
 1¶O PROD     O ROYAL    G PROD     G ROYAL   ALL ROYALTOT REV
 2¶
 3¶           0          0          0          0          0   120625
 4¶           0          0          0          0          0   130000
 5¶           0          0          0          0          0   139375
 6¶           0          0          0          0          0   148750
 7¶           0          0          0          0          0   158125
 8¶    6562.5 28710.94       13125 4544.531 33255.47 208568.0
 9¶   15312.5 66992.19       30625 10603.91 77596.09 270096.1
10¶     26250 114843.8       52500 18178.13 133021.9 342709.4
11¶     35000   153125       70000  24237.5 177362.5   387050
12¶     43750 191406.3       87500 30296.88 221703.1 431390.6
13¶     43750 191406.3       87500 30296.88 221703.1 431390.6
14¶     43750 191406.3       87500 30296.88 221703.1 431390.6
15¶     43750 191406.3       87500 30296.88 221703.1 431390.6
16¶     43750 191406.3       87500 30296.88 221703.1 431390.6
17¶     43750 191406.3       87500 30296.88 221703.1 431390.6
18¶     43750 191406.3       87500 30296.88 221703.1 431390.6
19¶     43750 191406.3       87500 30296.88 221703.1 431390.6
20¶     43750 191406.3       87500 30296.88 221703.1 431390.6
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  ¶    A    ¶¶    B   ¶¶    C   ¶¶   D   ¶¶    E    ¶¶    F   ¶¶    G   ¶¶    H   ¶¶    I   ¶¶   J   ¶¶    K   ¶¶    L    ¶
 1¶YEAR      TOT ACRE NEW ACRE AV CONSIDCONSID    OLD RENT NEW RENT RENT      BONUSES   DD ACRES DD PENS   INCOME
 2¶
 3¶     1983    12500    12500     19.3   241250        0    18750    18750   222500        0        0   241250
 4¶     1984    25000    12500     19.3   241250    18750    18750    37500   222500        0        0   260000
 5¶     1985    37500    12500     19.3   241250    37500    18750    56250   222500        0        0   278750
 6¶     1986    50000    12500     19.3   241250    56250    18750    75000   222500        0        0   297500
 7¶     1987    62500    12500     19.3   241250    75000    18750    93750   222500        0        0   316250
 8¶     1988    75000    12500     19.3   241250    93750    18750   112500   222500    12500    15625   350625
 9¶     1989    87500    12500     19.3   241250   112500    18750   131250   222500    25000    31250   385000
10¶     1990   100000    12500     19.3   241250   131250    18750   150000   222500    37500    46875   419375
11¶     1991   100000    12500     19.3   241250   131250    18750   150000   222500    37500    46875   419375
12¶     1992   100000    12500     19.3   241250   131250    18750   150000   222500    37500    46875   419375
13¶     1993   100000    12500     19.3   241250   131250    18750   150000   222500    37500    46875   419375
14¶     1994   100000    12500     19.3   241250   131250    18750   150000   222500    37500    46875   419375
15¶     1995   100000    12500     19.3   241250   131250    18750   150000   222500    37500    46875   419375
16¶     1996   100000    12500     19.3   241250   131250    18750   150000   222500    37500    46875   419375
17¶     1997   100000    12500     19.3   241250   131250    18750   150000   222500    37500    46875   419375
18¶     1998   100000    12500     19.3   241250   131250    18750   150000   222500    37500    46875   419375
19¶     1999   100000    12500     19.3   241250   131250    18750   150000   222500    37500    46875   419375
20¶     2000   100000    12500     19.3   241250   131250    18750   150000   222500    37500    46875   419375
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Scenario 6
Page 1

Scenario 6
Page 2

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   ¶     M    ¶¶    N     ¶¶    O     ¶¶    P     ¶¶    Q    ¶¶    R     ¶
 1¶O  PROD     O ROYAL    G  PROD     G ROYAL    ALL  ROYALTOT  REV
 2¶
 3¶           0           0           0           0           0   241250
 4¶           0           0           0           0           0   260000
 5¶           0           0           0           0           0   278750
 6¶           0           0           0           0           0   297500
 7¶           0           0           0           0           0   316250
 8¶       13125  57421.88         26250  9089.063  66510.94  417135.9
 9¶       30625  133984.4         61250  21207.81  155192.2  540192.2
10¶       52500  229687.5        105000  36356.25  266043.8  685418.8
11¶       70000    306250        140000     48475    354725    774100
12¶       87500  382812.5        175000  60593.75  443406.3  862781.3
13¶       87500  382812.5        175000  60593.75  443406.3  862781.3
14¶       87500  382812.5        175000  60593.75  443406.3  862781.3
15¶       87500  382812.5        175000  60593.75  443406.3  862781.3
16¶       87500  382812.5        175000  60593.75  443406.3  862781.3
17¶       87500  382812.5        175000  60593.75  443406.3  862781.3
18¶       87500  382812.5        175000  60593.75  443406.3  862781.3
19¶       87500  382812.5        175000  60593.75  443406.3  862781.3
20¶       87500  382812.5        175000  60593.75  443406.3  862781.3
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APPENDIX D. GLOSSARY OF OIL INDUSTRY TERMS

Block. An area, composed of separate contiguous leaseholds, appropriate in size for the drilling of an exploratory well. Before drilling an exploratory well, particularly when it is proposed to drill to a considerable depth at great expense, the operator will normally seek to acquire a sizable block of leases surrounding the site of the proposed exploratory well.

Bonus. Usually, the cash consideration paid by the lessee for the execution of an oil and gas lease by a landowner. Bonus is usually figured on a per acre basis.

Delay rental. A sum of money payable to the lessor by the lessee for the privilege of deferring the commencement of drilling operations or the commencement of production during the primary term of the lease. Also referred to as delay drilling penalty.

Directional drilling. The drilling of a well that departs materially from the vertical.

Drainage. Migration of oil or gas in a reservoir due to a pressure reduction caused by production from wells bottomed in the reservoir. Local drainage is the movement of oil and gas toward the well bore of a producing well. Under the rule of capture there is no liability for producing oil or gas drained from beneath the land of another, absent negligent waste and destruction of the product drained. Under the offset well covenant, a lessee may be liable for local drainage away from the leasehold if he fails to drill offset wells to prevent the drainage.

Dry hole agreement. An agreement similar to a bottom hole letter except that it creates an obligation to be performed upon the drilling of a dry hole whereas the latter creates an obligation to be performed upon the drilling of a well to a specified depth, whether or not the well is dry.

Economic rent. A term in usage among economists to describe any surplus in the income of a factor of production--land, labor, or capital--in excess of the minimum amount necessary to call forth that factor's productive services.

Farm out agreement. A very common form of agreement between operators, whereby a lease owner not desirous of drilling at the time agrees to assign the lease, or some portion of it (in common or in severalty) to another operator who is desirous of drilling the tract. The assignor in such a deal may or may not retain an overriding royalty or production payment. The primary characteristic of the farm out is the obligation of the assignee to drill one or more wells on the assigned acreage as a prerequisite to completion of the transfer to him.

Non-drilling lease. A lease which grants the lessee the usual rights relative to oil or gas under described premises but which provides that a well shall not be surfaced on the premises.

Offset well. A well drilled on one tract of land to prevent the drainage of oil or gas to an adjoining tract of land, on which a well is being drilled or is already in production.

Operating agreement. An agreement between concurrent owners, between owners of interests in adjacent properties, or between parties to a pooling or unitization agreement for the testing and development of a tract of land. Typically one of the parties is designated as the operator and the agreement contains detailed provisions concerning the drilling of a test well, the drilling of any additional wells which may be required, the sharing of expenses, and accounting methods. The authority of the operator, and restrictions thereon, are spelled out in detail in the typical agreement.

Operating interest. The mineral interest minus the royalty interest. An interest in oil and gas that is burdened with the cost of development and operation of the property. The operating interest is normally created by an oil and gas lease.

Overriding royalty. An interest in oil and gas produced at the surface, free of expense of production, and in addition to the usual landowner's royalty reserved to the lessor in an oil and gas lease. While usage varies some, any royalty created out of the working interest in a lease is overriding royalty and many people also refer to any royalty reserved by the lessor in addition to the usual one-eighth royalty as overriding royalty. With regard to overriding royalty created apart from the execution of a lease, the interest may arise by grant or by reservation. Quite commonly in a farm out agreement and in other assignment of leases the assignor will reserve an overriding royalty.

Payout. Generally, the recovery from production of costs of drilling and equipping a well. Payout is usually precisely defined in an operating agreement.

Pooling. A term frequently used interchangeably with unitization but more properly used to denominate the bringing together of small tracts sufficient for the granting of a well permit under applicable spacing rules, as distinguished from unitization, which term is used to describe the joint operation of all or some portion of a producing reservoir. Pooling is important in the prevention of drilling of unnecessary and uneconomic wells, which will result in physical and economic waste.

Posted price. Posted price is defined in the CFR as "a written statement of crude petroleum prices circulated publicly among sellers and buyers of crude petroleum in a particular field in accordance with historic practices, and generally known by sellers and buyers within the field."

Primary term. The period of time, typically five or ten years, during which a lease may be kept alive by a lessee even though there is no production in paying quantities by virtue of drilling operations on the leased land or the payment of rentals. After the expiration of the primary term, the lease usually can be kept alive only by production in paying quantities.

Royalty. The landowner's share of production, free of expenses of production. Although the royalty is not subject to costs of production, usually it is subject to costs incurred after production, e.g., production or gathering taxes, costs of treatment of the product to render it marketable, and costs of transportation to market. Occasionally a lease provides that the royalty payable to the lessor shall be a larger or smaller fractional interest depending on the volume of production.

Rule of capture. The legal rule of non-liability for (1) causing oil or gas to migrate across property lines and (2) producing oil or gas that was originally in place under the land of another, so long as the producing well does not trespass. The rule has been phrased as follows:

"The owner of a tract of land acquires title to the oil and gas which he produces from wells drilled thereon, though it may be proved that part of such oil or gas migrated from adjoining lands."

Stripper well. A well which produces such small volume of oil that the gross income therefrom provides only a small margin of profit or, in many cases, does not even cover actual cost of production.

Title opinion. A statement of opinion by an attorney, often in the form of a letter, as to the state of the title to land, mineral, royalty or working interests.

Unit agreement. An agreement or plan of development and operation for the recovery of oil and gas made subject thereto as a single consolidated unit without regard to separate ownerships and for the allocation of costs and benefits on a basis as defined in the agreement or plan.

Working interest. The operating interest under an oil and gas lease. The owner of the working interest has the exclusive right to exploit the minerals on the land.

SOURCE: Definitions for this glossary came primarily from "Oil and Gas Law, Manual of Oil and Gas Terms," by Howard R. Williams and Charles J. Meyers, Matthew Bender Publishing House, New York and San Francisco, 1981.

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